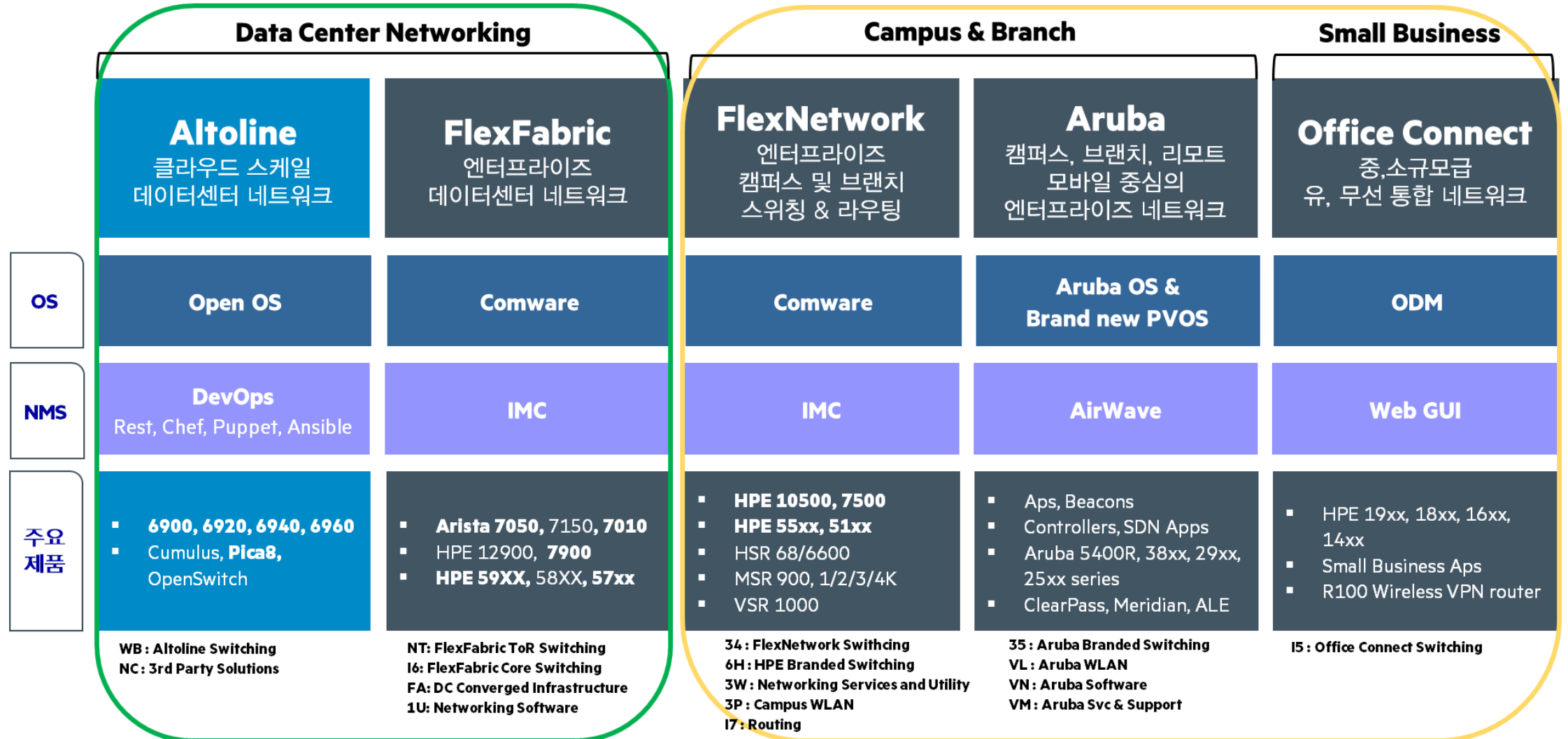


HPE Data Center Networking

DCN Specialist
Kim, Won-Shik

March 27, 2018

HPE Networking Business Strategy



FY18 HPE Networking Business

Hybrid IT DC Networking

Switching

BA_I600	FlexFabric Core Switching
BA_NT00	Flexfabric ToR Switching
BA_FA00	Data Center Converged Infrastructure
BA_WB00	Altoline Switching

SDCG Networking

BA_1U00	Networking Software
BA_NC00	3rd Party Solutions
BA_L100	Arista HW/SW
BA_L200	DCN Services

DCN Software Maintenance

BA_1091	DCN Software Maintenance
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Edge HPE Aruba Product

Campus Switching

BA_3500	Aruba Branded Switching
BA_3400	FlexNetwork Switching
BA_6H00	HPE Branded Switching
BA_I500	Office Connect Switching

Application & Routing

BA_I700	Routing
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Edge Compute

BA_2M00	Moonshot
BA_S200	Converged IoT Systems - Edgeline

WLAN

BA_VL00	Aruba WLAN
BA_VN00	Aruba Location Based Products

HPE Aruba Services

HPE Aruba Services

BA_VR00	Aruba WLAN Services
BA_L400	Aruba Security Services
BA_L500	Aruba Cloud and Network Mgmt Services
BA_L600	Aruba Location Based Services
BA_L700	Aruba OC WLAN Services
BA_LS00	Aruba Campus Services

<Business Keywords>

DCN : SDN, Data Center Core스위치, ToR 스위치, Arista

Aruba : Campus wired & wireless, Access Security, Router, Edgeline

HPE Data Center Networking 삼총사



FlexFabric (루크)
TOR, Core, Backbone
안정성, 합리적 가격
전통 DataCenter

Arista (아니킨)



Altoline (레이)
SDDC
SDN
Cloud

10G/25G/40G/100G 서버 연결

중 대규모 이상 서버 연결

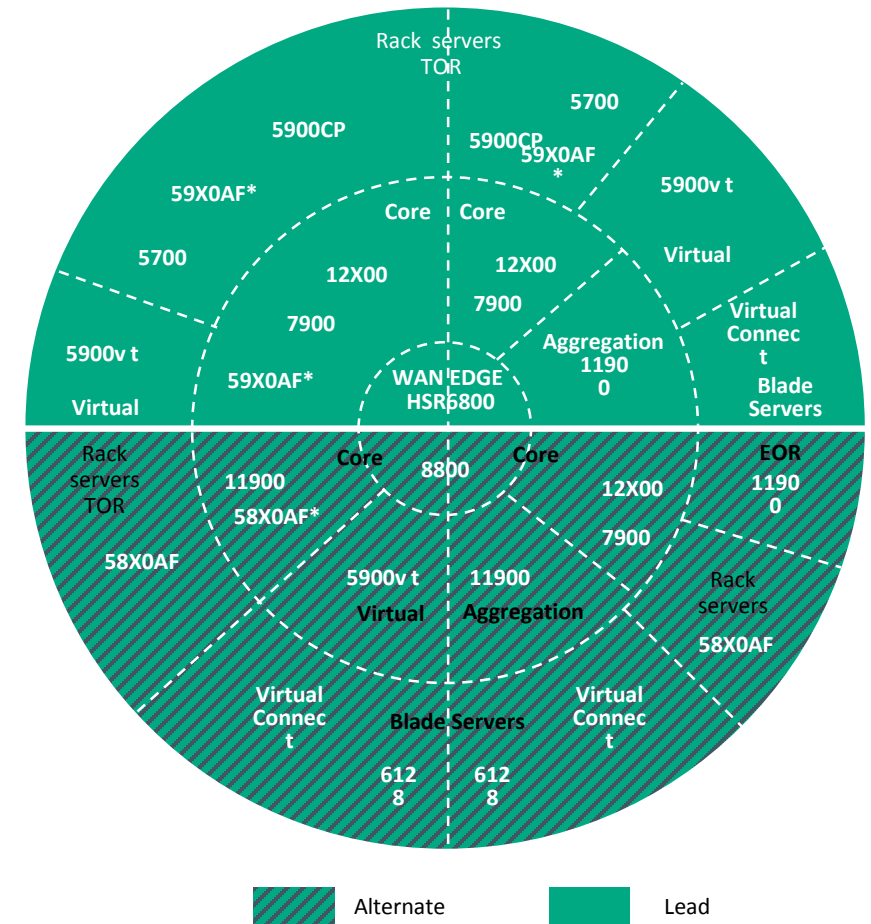
Data Center Networking
Server 연결 = DCN



HPE FlexFabric TOR

HPE DCN ToR Positioning

- Data Center의 ToR 스위치에 최적화된 59xx series
 - Reversible airflow
 - 10GbE, 40GbE, 100GbE with options for FC
 - Big Data 및 IP Storage를 위한 Deep Packet Buffer
 - Deep buffered 5980 ideal for Big Data & IP Storage with large fan-in ratios
- Campus Network 의 Core 혹은 Small Enterprise의 Core에 적합한 제품군



HPE FlexFabric 59xx/5700 Series Architecture

Overview

- 1-RU or 2-RU 의 Top of rack switch
- High Performance (up to 2976 Mpps Throughput and 3.2 Tbps switching capacity)
- AC/DC power 모두 수용가능한 Hot swappable PDU 제공
- SPB/L2 VXLAN/ L3 VXLAN 지원
- Simpler network management (up to 9 units)를 위한 IRF 제공
- Data Center Bridging (DCB) & FCoE 지원
- 추가 라이선스 없이 Layer 3 MPLS 지원
- Auto configuration 지원 (Python, Chef, Puppet, Ansible 기반 지원)
- MACSec 지원
- 새로운 제품군인 HPE FF 5980을 통한 Deep buffer 제공 (4GB)



HPE FF 5700 Series

- 32 x 10GbE Base-T + 8 x 10GbE SFP+ + 2 x 40GbE QSFP+ ports
- 40 x 10GbE SFP+ + 2 x 40GbE QSFP+ ports
- 48 x 1GbE Base-T + 4 x 10GbE SFP+ + 2 x 40GbE QSFP+ ports



HPE FF 5900 Series

- 48 x 10GbE Base-T + 4 x 40GbE QSFP+ ports
- 48 x 1GbE Base-T + 4 x 10GbE SFP+ + 2 x 40GbE QSFP+ ports
- 48 x 1/10GbE SFP+ + 4 x 40GbE QSFP+ ports
- 48 x 1/10GbE SFP+ or 2/4 G FC + 4 x 40GbE QSFP+ ports



HPE FF 5930 Series

- Up to 96 x 1/10GbE Base-T/SFP+ + 8 x 40GbE QSFP+ ports
- 32 x 40GbE QSFP+ ports
- 2 and 4 Slot Chassis
- L2 VXLAN



HPE FF 5940 Series

- Up to 96 x 1/10GbE Base-T/SFP+ + 8 x 40GbE QSFP+ ports
- 32 x 40GbE QSFP+ ports
- 2 and 4 Slot Chassis
- EVPN and L3 VXLAN



HPE FF 5950 Series

- Up to 128 x 1/10GbE SFP+ (splitter cables)
- Up to 128 x 25GbE QSFP28 (splitter cables)
- 32 x 40GbE QSFP+ ports (using 40GbE port mode)
- 32 x 100GbE QSFP28 ports - fixed



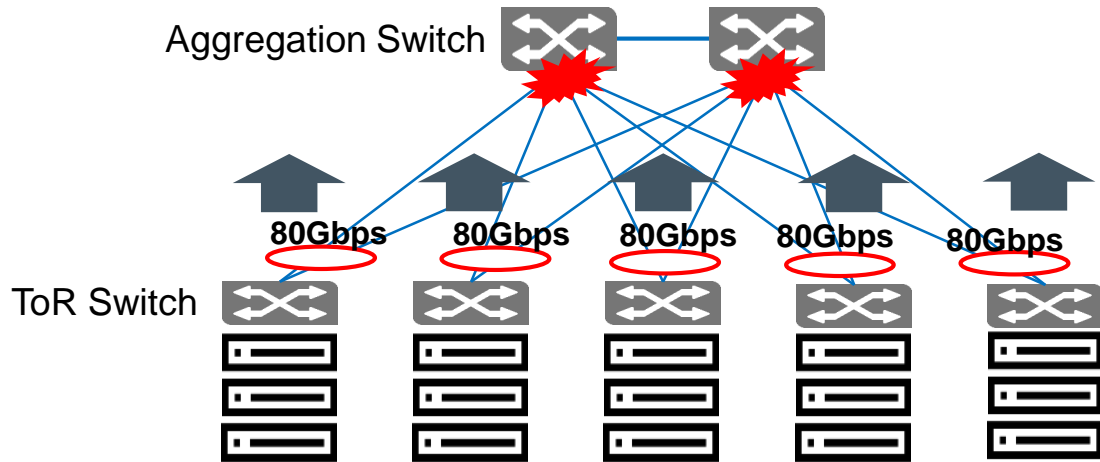
HPE FF 5980 Series

- 48 x 1/10GbE SFP+
- 6 40GbE/100GbE QSFP+/QSFP28
- Deep Buffer
- EVPN and L3 VXLAN



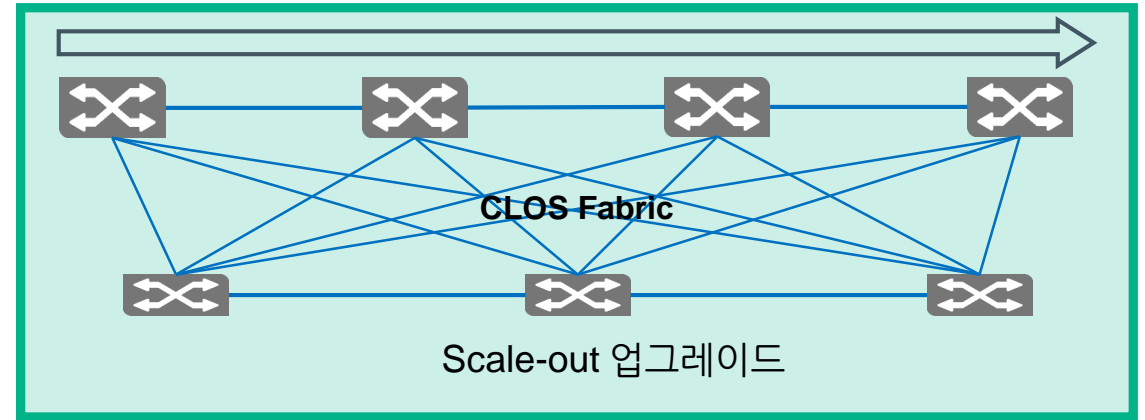
IRF & Scale-out 구성 (타사 대비 장점)

AS-IS



- ToR 스위치와 L3 스위치 간 Bottleneck 발생 (패킷 유실)
- Non-Blocking 네트워크 구성이 필요
- 이슈 해결을 위한 전체 네트워크의 성능 업그레이드 요구됨

TO-BE



- 저비용으로 전체 네트워크의 성능업그레이드 가능함
Scale-out
- 기존 ToR 스위치를 최대한 활용가능한 유연성 제공, 모든 Link는 All Active-Active로 동작
- 순간 Burst 트래픽이 발생해도 트래픽 유실 및 지연 없음
No buffering → Bandwidth upgrade

1G UTP Mgmt용 / 저비용 10G 스위치 : HPE FF5700

HPE 1/10Gb Ethernet Switch

HPE FlexFabric 5700



- ✓최대 960Gbps fixed port 48 x 1GbE or 40 x 10GbE
- ✓UTP 타입 모델 제공하여 MGMT용 적합
- ✓Uplink로 10G / 40G interface support

QSFP
40G



QSFP
4*10G



1G UTP타입 switch

(1G * 48 port & 10G * 4 port * 40G * 2 port)

PN	Description	Qty
JG894A	HPE 5700 48G 4XG 2QSFP+ Switch	1
U4VF3E	HPE 3Y FC 24x7 FF 5700 SVC [for JG894A]	1
JC683A	HPE 58x0AF Frt(prt) Bck(pwr) Fan Tray	2
JG900A	HPE A58x0AF 300W AC Power Supply	2
JG900A		
AC6	INCLUDED: Power Cord - Korea localization	2
JL437A	HPE X130 10G SFP+ LC SR DC Transceiver	xx
JL251A	HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	x

10G SFP+타입 switch

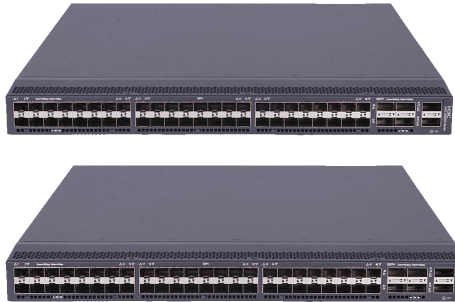
(10G * 40 port & 40G * 2 port)

PN	Description	Qty
JG896A	HPE 5700 40XG 2QSFP+ Switch	1
U4VF3E	HPE 3Y FC 24x7 FF 5700 SVC [for JG896A]	1
JC683A	HPE 58x0AF Frt(prt) Bck(pwr) Fan Tray	2
JG900A	HPE A58x0AF 300W AC Power Supply	2
JG900A		
AC6	INCLUDED: Power Cord - Korea localization	2
JL437A	HPE X130 10G SFP+ LC SR DC Transceiver	xx
JL251A	HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	x

10G SFP+ 연결용 / 10G UTP 연결용 스위치 : HPE FF5940

HPE 10Gb Ethernet Switch

HPE FlexFabric 5940



- ✓최대 2.16Tbps fixed port 48 x 10GbE
- ✓UTP / 광케이블 타입 모델 모두 제공
- ✓Uplink로 40G / 100G interface support



10G SFP+ 타입 switch (10G * 48 port & 40G * 6 port)

PN	Description	Qty
JH395A	HPE FF 5940 48SFP+ 6QSFP+ Switch	1
H2SH4E	HPE 3Y FC 24x7 5940 Fixed 48G SVC [for JH395A]	1
JG552A	HPE X711 Frt(prt) Bck(pwr) HV Fan Tray	2
JC680A	HPE 58x0AF 650W AC Power Supply	2
JC680A		
AC6	INCLUDED: Power Cord - Korea localization	2
JL437A	HPE X130 10G SFP+ LC SR DC Transceiver	xx
JL251A	HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	x

10G UTP 타입 switch (10G * 48 port & 40G * 6 port)

PN	Description	Qty
JH394A	HPE FF 5940 48XGT 6QSFP+ Switch	1
H2SH4E	HPE 3Y FC 24x7 5940 Fixed 48G SVC [for JH394A]	1
JG552A	HPE X711 Frt(prt) Bck(pwr) HV Fan Tray	2
JC680A	HPE 58x0AF 650W AC Power Supply	2
JC680A		
AC6	INCLUDED: Power Cord - Korea localization	2
JL251A	HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	x

40G 연결용 스위치, Spine 스위치 : HPE FF 5940

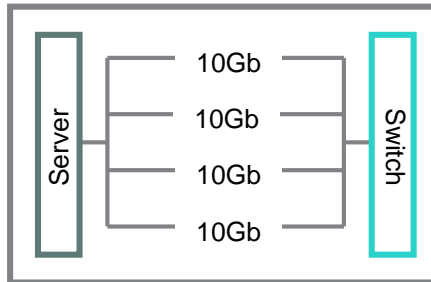
HPE 40Gb Ethernet Switch

HPE FlexFabric 5940



- ✓ 최대 2.56Tbps fixed port 32 x 40GbE
- ✓ 128x10GbE 포트 구성 (splitter cables)

10G 기반에서 40G 확장



QSFP
40G



QSFP
4*10G



HPE 10/40GbE Network Adapters



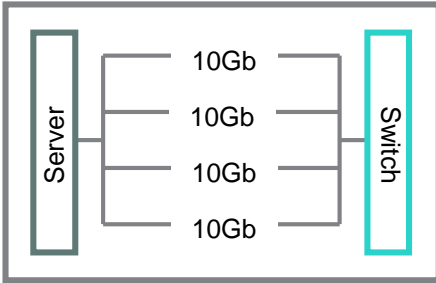
40G QSFP+ 타입 switch (40G * 32 port)

PN	Description	Qty
JH396A	HPE FF 5940 32QSFP+ Switch	1
H2SH4E	HPE 3Y FC 24x7 5940 Fixed 48G SVC [for JH396A]	1
JG552A	HPE X711 Frt(prt) Bck(pwr) HV Fan Tray	2
JC680A	HPE 58x0AF 650W AC Power Supply	2
JC680A		
AC6	INCLUDED: Power Cord - Korea localization	2
JL251A	HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver	xx

25G 연결용 / 100G 연결용 스위치 : HPE FF 5950

HPE 25/100Gb Ethernet Ecosystem

10G 기반에서 40G 확장



QSFP28
100G



HPE 25GbE
Network Adapters

QSFP28
4*25G



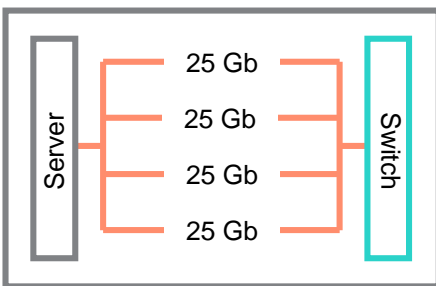
QSFP
40G



QSFP
4*10G



25G 기반에서 100G 확장



✓6.4Tbps fixed port 48/32 x
25/100GbE

✓32x40/100GbE 포트 구성

✓64x50GbE & 128x10/25GbE
포트 구성 (splitter cables)

25G switch (25G * 48 port & 100G * 8 port)

PN	Description	Qty
JH402A	HPE 5950 48SFP28 8QSFP28 Switch	1
H5YQ7E	HPE 3Y FC 24x7 FF48SFP28 8QSFP28 SwtcsVC [for JH402A]	1
JH388A	HPE X711 Frt(prt)-Bck(pwr) HV2 Fan Tray	5
JC680A	HPE 58x0AF 650W AC Power Supply	2
JC680A		
AC6	INCLUDED: Power Cord - Korea localization	2
JL293A	HPE X190 25G SFP28 LC SR 100m MM Transceiver	xx
JL274A	HPE X150 100G QSFP28 SR4 100m MM Transceiver	xx

100G switch (100G * 32 port)

PN	Description	Qty
JH321A	HPE FF 5950 32Q28 Switch	1
H2HK7E	HPE 3Y FC 24x7 FF 5950 32Q28 Swch SVC [for JH321A]	1
JH388A	HPE X711 Frt(prt)-Bck(pwr) HV2 Fan Tray	6
JC680A	HPE 58x0AF 650W AC Power Supply	1
JC680A		
AC6	INCLUDED: Power Cord - Korea localization	1
JL274A	HPE X150 100G QSFP28 SR4 100m MM Transceiver	xx
JL437A	HPE X130 10G SFP+ LC SR DC Transceiver	xx

New

iSCSI 연결용 / Big Data or AI 연결용 10G 스위치 : HPE FF 5980

HPE 10Gb Ethernet Switch

New

HPE FlexFabric 5980



- ✓최대 960Gbps fixed port 48 x 10GbE
- ✓Uplink로 40G / 100G interface support
- ✓Deep Packet Buffer (4GB)
- ✓Splitter Cable 서포트하지 않음

10G SFP+ 타입 switch (10G * 48 port & 100G * 6 port)

PN	Description	Qty
JQ026A	HPE 5980 48SFP+ 6QSFP28 Switch	1
H9XR5E	HPE 3Y FC 24x7 FF 5980 48SFP+ Swch SVC [for JQ026A]	1
JH388A	HPE X711 Frt(prt)-Bck(pwr) HV2 Fan Tray	5
JC680A	HPE 58x0AF 650W AC Power Supply	2
JC680A		
AC6	INCLUDED: Power Cord - Korea localization	2
JL437A	HPE X130 10G SFP+ LC SR DC Transceiver	xx
JL274A	HPE X150 100G QSFP28 SR4 100m MM Transceiver	x
JD120B	HPE X110 100M SFP LC LX Transceiver	x



**Hewlett Packard
Enterprise**

판매 Point



AOC를 적극 활용

(서버 + 스위치 양쪽 고려시 1/4 이하로 가격 경쟁력 생김)

(서버 다수 연결시 => 스위치 무료 효과 및 마진 보정 가능)





맞춤형 Switch 제공

(mgmt/10G/25G/40G/100G)

SDN 없이 Scale-Out 구조 가능

(IRF 이용 / Leaf-Spine Fabric 구성 / All Active 구성)

Data Center
Core / 집선
샤시형 스위치
차세대 오픈환경



DCN



HPE FlexFabric Core / 집선

HPE FlexFabric 12900E Switch Series

전통적인 Data Center 및 Cloud 환경의 Data Center 모두 적합한 Backbone Switch 입니다.

Up to **184 Tbps**
switching capacity

Up to **768**
40 GbE ports

Up to **576**
100 GbE ports



12901E

12902E

12904E

12908E

12916E

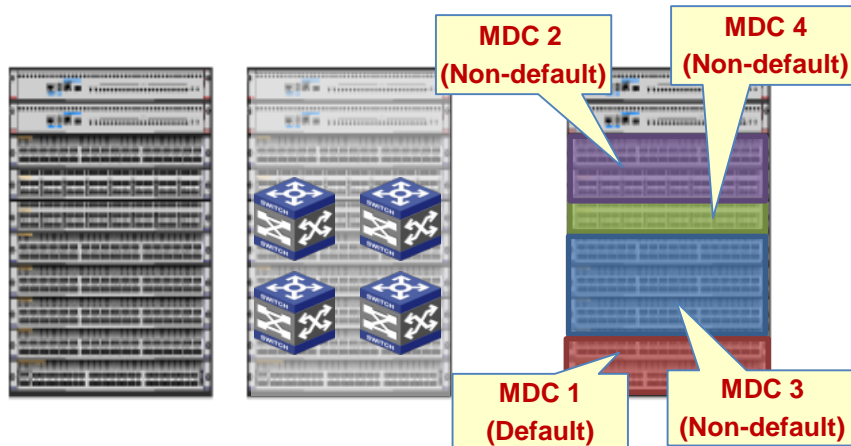
Target Deployments	Small DC	Small / Medium DC	Medium DC	Large Data Center	
Max 100GE Density	40 x 100G	96 x 100G	144 x 100G	288 x 100G	576 x 100G
Max 40GE Density	48 x 40G	96 x 40G	192 x 40G	384 x 40G	768 x 40G
Max 1/10GE Density	48 x 1/10G	96 x 1/10G	192 x 1/10G	384 x 1/10G	768 x 1/10G
Switching Capacity	9.6 Tbps	19.2 Tbps	28.8 Tbps	57.6 Tbps	184 Tbps
Footprint	2RU	3RU	6RU	12RU	21RU

Powered by Comware v7
 IRF/TRILL/SPB, L2/L3 IPv4/IPv6, MPLS/VPLS, **VXLAN L2 & L3 제공**
업계 최고 수준의 SDN Ready (OPENFLOW 1.3, NETCONF, OVSDB, REST API 제공)

HPE FlexFbric 12900E Switch Series >> 제품 특징

1:N 장치 가상화

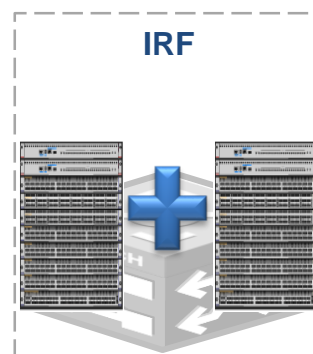
- 1:N 장치 가상화 기술 – 하나의 물리적인 장치를 여러개의 논리적인 장치로 분리하여 스위칭 및 라우팅 네트워크를 분리 및 격리 수용
- 제어부, 데이터부 및 관리 부분 전반의 가상화
- 스위치 시스템의 하드웨어 자원을 가상화
 - 인가된 논리적인 장치에서 물리적인 인터페이스 혹은 포트를 할당
 - 논리적인 장치의 스위치 시스템 자원 사용을 제한 (CPU, Memory 크기 & 저장장치용량 등)



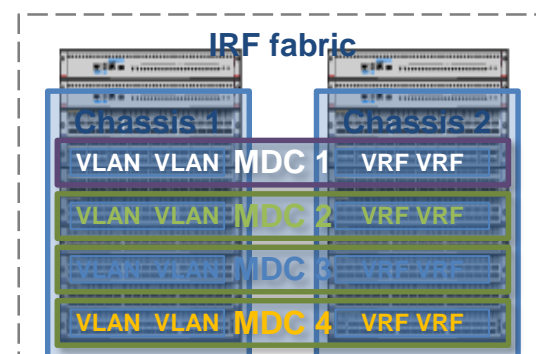
N:1 & 1:N 장치 가상화

- N:1 장치 가상화로 생성된 논리적인 하나의 스위치 시스템을 1:N 장치 가상화로 다시 논리적인 스위치 시스템으로 격리 및 분리
- 제어부 및 데이터부 자원의 동적 할당
- 고 가용성 기본으로 뛰어난 확장성을 제공
- 장치 가상화 고도화를 위한 복합 기술

N:1 장치 가상화



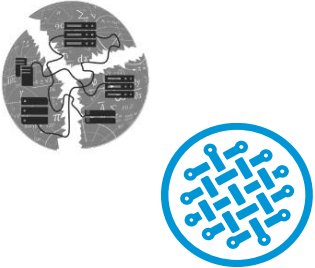
N:1 & 1:N 장치 가상화



HPE FlexFabric 12900E Switch Series >> 경쟁력

제품 특징점

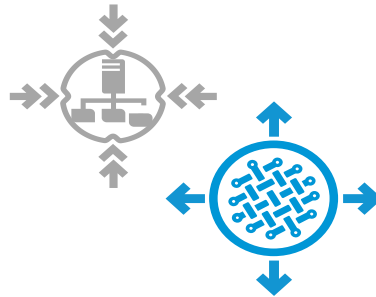
구성, 운영 및 관리



복잡성 제거

- 유연한 링크 및 장치의 추가 작업
- 네트워크의 가상화 및 추상화 전개
- 운영의 복잡성을 75% 까지 제거
- I/O 통합 - DCB/FCoE

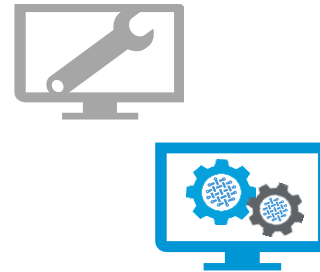
서비스 확장



Scale-Out

- 네트워크 용량의 정량화로 네트워크 병목 제거
- 대규모의 병렬 처리 준비
- 적극적이고 폭발적인 로드 확대 및 트래픽 증가 대응
- 서비스를 위한 다양한 기능 준비

오류 발생 제거



자동화

- 서비스 전개에 필요한 기존 구성 방식 탈피 - 수 작업의 한계 제거
- 피할 수 없는 human fault 최소화
- iMC, IRF & SDN

미래 대응



데이터 센터 복합 기술

- 소프트웨어 정의 네트워크 준비 - OpenFlowv1.3
- 데이터 센터 복합 기술 - EVB/VEPA, FCoE, DCB, TRILL, MDC & EVI 등

HPE FlexFbric 12900E Switch Series >> 경쟁 비교

	HPE (FlexFabric 12916/12908/12904/12902/12901)	Cisco (Nexus 9516/9508/9504)
Architecture	CLOS/VOQ Deep Buffers	CLOS Packet Based
Switching Capacity	184/57.6/28.8/192/9.6Tbps	60/30/15 Tbps
Density (Per LPU/Chassis)		
10G	768/384/192/96/48 (48p)	768/384/192 (48p)
40G	768/384/192/96/48 (48p)	576/288/144(36p)
100G	576/288/144/72/36(36p)	512/256/128(32p)
Virtualization		
L2 Scale	MAC: 750K	MAC: 160K
Fabric	IRF, TRILL	FabricPath
VM Mobility/Overlay	VXLAN (L2/L3) L2 (EVI)	VXLAN (L2/L3)
Cloud		
Multi-tenancy	MPLS/Q-in-Q, VXLAN (L2/L3), MDC	VXLAN (L2/L3)
Convergence		
FCoE/DCB	FCoE/DCB	Requires FEX
SDN	OF1.3	ACI

HPE FlexFbric 12900E Switch Series >> 경쟁 비교(계속)

	HPE 12900 HB Line Cards	HPE 12900 FX Line Cards	HPE 12900 FE Line Cards	X9400, X9500 and X9600 Line Cards	X9432-S Line Card
Packet Buffer	Up to 24GB/Module	Up to 16GB/Module		12 / 24 / 36 / 104 MB	32 MB
MAC Address	750K	Up to 256K		160K	40K (104K)
ARP (host)	350K	16K/128K (Uni mode)	16K/128K (Uni mode)	208K	104K
IPV4 LPM	250K	32K	Up to 512K	88K	
IPV6 LPM	64K	8K	Up to 256K	20K (80K with no IPv4 routes)	
Ingress/Egress ACL	40K/20K	18K/9K	50K/9K	3072 / 768 (per network forwarding engine)	
MPLS VPN	4K	512	1K	Yes	
TRILL	Yes			FabricPath	
DCB/FCoE	Yes			Requires FEX	
DCI	EVI			No Support	
VxLAN (L2, L3)	Yes			Yes	
Interface Options	36 * QSFP28 18 * QSFP28 / 18 * QSFP+ 48 * QSFP+ 48 * SFP+ / 2 * QSFP28	48 * 1G BASE-T 48 * 10G BASE-T 48 * 1/10G SFP+ 36 * 40G QSFP+ 24 * 40G QSFP+ 12 * 40G QSFP+ 8 * 100G CXP / CFP2	48 * 10G SFP+ 24 * 40G QSFP+	48 * 10G BASE-T 48 * 1/10G SFP+ 36 * 40G QSFP+ 32 * 40G QSFP+ 8 * 100G CFP2	32 * 100G QSFP28

HPE FlexFbric 12900E Switch Series >> 경쟁 비교(계속)

	MDC	VDC
Software license	Not required	라이선스 추가 필요
Virtualization	1:N + N:1 네트워크 가상화	1:N 네트워크 가상화
Scalability	2대 (향후, 4대 확장)	1대
Platform Dependent	Comware 7 based chassis switch	Nexus 7K (<u>no 9K support</u>)
High Availability	Multi-chassis and up to tenant level	Single chassis
Cabling & Configuration Complexity	Lower	Higher
DCI support	MDC 별 EVI 제공	모든 VDC가 OTV 를 위한 VDC 공유
Management	IMC (멀티 벤더를 위한 단일 플랫폼)	Nexus 를 위한 별도 관리 플랫폼

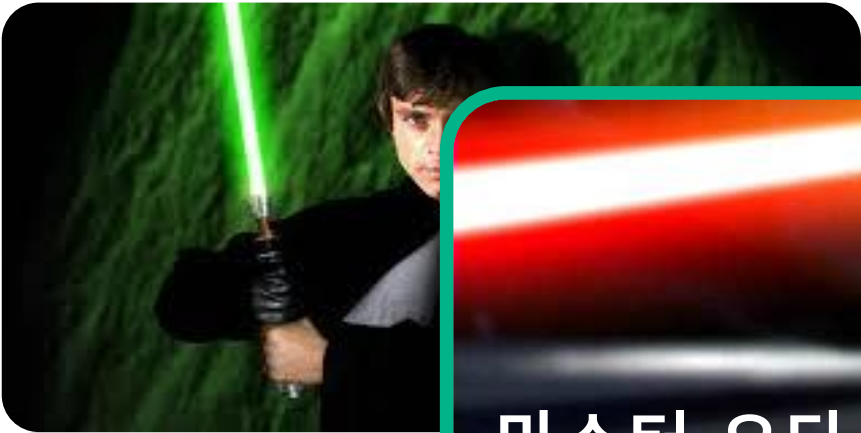


**Hewlett Packard
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판매 Point



HPE Data Center Networking 삼총사



FlexFabric
TOR, Core
안정성, 합
전통 DataCenter



마스터 요다 (HPE김원식)
Core/집선 스위치
Attached TOR
Data Center, SDN



Altoline (레이)
SDDC
SDN
Cloud



H3C 한국 지사 설립 관련 루머

H3C 한국 지사장 면접 관련 루머

WW DCN 수장 답변 (Wilde, Dominic M.)

- 2021년까지 중국을 제외한 지사 설립 제한 계약 되어 있는 상태
- 만약 설립 움직임 관련 증거 있으면 즉시 보내줄 것
- H3C Chairman과 Board에 즉시 Escalation 할 예정
- HPE가 여전히 49%의 지분을 가지고 있으며 Board 멤버 1/2이 HPE 소속으로 구성
- 따라서 2021년까지인 계약은 renew 될 예정

HPE Flex Fabric Top of Rack Switching Roadmap

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">25G/100G</p> <p>5950 Series</p> <ul style="list-style-type: none"> • 32-port 100G QSFP28 1RU Switch • 48-port 25GbE + 6-port 100GbE Fixed port Switch <p>5950 Modular</p> <ul style="list-style-type: none"> • 4-Slot Switch • 8-port 100G, 16-port 40G, 24-port 25G Modules 	<p>5950 Modules</p> <ul style="list-style-type: none"> • 8-port 100GbE MACSEC Module 		<p>5945 Series (TD3)</p> <ul style="list-style-type: none"> • 48-port 25G 8 port 100G • 4 Slot Switch 	<p>5945 Series (TD3)</p> <ul style="list-style-type: none"> • 32-port 100G • 2 Slot Switch
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">10G/40G/100G</p> <p>5940 Fixed</p> <ul style="list-style-type: none"> • 48-port 10GbE (SFP+ & Copper) Fixed, 32-port 40GbE Fixed <p>5940 Modular</p> <ul style="list-style-type: none"> • 2-Slot Mod w/2-port 40GE • 4-Slot Mod Switches uses modules from 5930 series 	<p>5940 Modules</p> <ul style="list-style-type: none"> • 8-Port 40GbE MACSEC <p>5980 Series Qumran MX</p> <ul style="list-style-type: none"> • 48-port SFP+ 6-port QSFP28 Large Buffer Switch 		<p>5930/40 Modules</p> <ul style="list-style-type: none"> • 16-port 16/32Gbps FC Module 	<p>5945 Modules</p> <ul style="list-style-type: none"> • 16-port 16/32Gbps FC Module
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">1G/10G/40G</p> <p>5900 1GbE</p> <p>Full Layer 2 & Layer 3 Features</p> <p>5700 1GbE</p> <p>Full Layer 2, Light Layer 3 Features</p>		<p>5710 Series (Maverick)</p> <p>48x1/10G SFP+ & BaseT& 24x1/10G SFP+ w/6* 40G/2*100;</p>	<p>5710 Series (Maverick)</p> <p>24x1/10G BaseT 6*40G/2*100G</p>	<p>5600 Series (OOB)</p> <p>48x1G BaseT + 4*10G</p> <p>5610 Series</p> <p>48-port 1G BaseT + 4*10G</p> <p>PEX Series (Pipe)</p> <p>48-port SFP+ 4QSFP28</p>
<p>Current</p>	<p>CY17Q4</p>	<p>CY18Q2</p>	<p>CY18Q3</p>	<p>CY18Q4</p>

HPE Flex Fabric Core/집선 스위치 Roadmap

12900/12900E	12900E Switch Series <ul style="list-style-type: none"> • 4, 8 & 16 Slot Chassis • H Series Modules (HB, HF) <ul style="list-style-type: none"> ➢ 36p 100G QSFP28 HB ➢ 48p 40G QSFP+ HB ➢ 48p 10G SFP+ 2p 100G QSFP28 ➢ 18p 40G + 18p 100G HB ➢ 18p 40G + 18p 100G HF 	2-Slot Chassis <ul style="list-style-type: none"> ▪ 12902E, 3RU ▪ Chassis/MPU/HS Fan ▪ 3000W AC Power Supply 	1-Slot Chassis <ul style="list-style-type: none"> ▪ 12901E, 2RU ▪ Accessories 	12900E Line Cards <ul style="list-style-type: none"> • 24p 10G + 4p 100G HD • 5950 Mod Support • 100G MACSEC 	7904E (Jericho2) <ul style="list-style-type: none"> ▪ 4 slot 2RU chassis ▪ Support for 10G & 100G ▪ Backward compatible with 5930/5940/5950 Modules
	12900E Switch Series <ul style="list-style-type: none"> • 4, 8 & 16 Slot Chassis • F Series Modules (FX, FE, FC) 	12900E Accessories <ul style="list-style-type: none"> ▪ High Speed Fan Trays ▪ 12900E v2 MPU 	12900E Line Cards <ul style="list-style-type: none"> • 24p 10G + 2p 40G HB • 5930/5940 Mod Support • 10GBASE-T • 10G MACsec • 48p 10G SFP+ HF 	12900E Accessories <ul style="list-style-type: none"> • 1800W DC PS (12902E) • 43.2Tbps SFM for 12916E 	12900E 400G (Jericho2) <ul style="list-style-type: none"> • 24p 400G QSFP-DD
	12900 Switch Series <ul style="list-style-type: none"> • 10 & 16 Slot Chassis • E Series Modules (EA, EB, EC) 				
7900	7900 Switch Series <ul style="list-style-type: none"> • Compact Modular 2RU & 5RU • 4 & 10 Slot Chassis • 1/10G, 40G & CFP2 100G Modules 				
12500	12500 Switch Series <ul style="list-style-type: none"> • 4, 8 & 18 Slot Chassis • E & F Series Modules • EB, EC, EF, FD & FG Modules 				
	Current			Q2CY18	Future



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Thank You

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